

## ABSTRACT OF THE DISCLOSURE

A novel cyclone is disclosed that is effective for separating, from a contaminated gas stream, solid particulates having diameters as low as 4 to 5 microns. When multiple cyclones of the present invention are affixed between upper and lower tube sheets in a separator device, fine particle removal is possible to the extent required 1) by stringent regulations governing particulate emissions into the atmosphere, or 2) to prevent damage to turbine blades in downstream power recovery equipment. The cyclones are especially relevant to the problem of removing catalyst fines from refinery effluents, most notably fluid catalytic cracking (FCC) regenerator flue gas. The cyclone separation efficiency is enhanced through the use of 1) a uni-directional flow of gas from the contaminated gas inlet to the clean gas outlet and 2) discharge openings on the surface of the cyclone body that allow ejection of solid particulates.